

REMARKS/ARGUMENTS

Claims 22-45 are pending in this application, with claim 22 being the only independent claim. Claims 22, 23, and 44 are amended as described below and claim 45 is added. Reconsideration of the above-identified application, as herein amended and in view of the following remarks, is respectfully requested.

Priority

The Examiner acknowledges applicants' claim to foreign priority but states that a claim for priority can not be made because the U.S. Application was filed more than 12 months after the filing date of the priority document. Applicants note that the this application is a U.S. National Stage application filed under 35 U.S.C. §371 and based on International Application No. PCT/DE2003/002886 dated September 1, 2003. Accordingly, the U.S. filing date of the present application is the filing date of the International Application, which is less than 12 months after the filing date of the priority document.

Objection to the Title

Applicants have amended the title to clearly indicate the invention to which the claims are directed. Accordingly, the objection to the title should now be withdrawn.

Objection to the Abstract

The Abstract was objected to for failing to concisely describe the subject matter of the present invention. A new Abstract is now presented to address the objection. In view of the new Abstract, the objection to the abstract should now be withdrawn.

Objection to the Drawings

The drawings were objected to because the Examiner states that reference character 2 in the Figures is not mentioned in the description in the Specification. The preliminary

amendment filed with the present application added reference character 2 to the paragraph beginning on page 7, line 1, of the English translation of the international application. Accordingly, the objection to the drawings should be withdrawn.

Claim Objections

Claim 44 is objected to as being a substantial duplicate of claim 37. To remedy this, claim 44 is amended to depend directly on claim 22, instead of claim 35. Accordingly, the objection to claim 44 should now be withdrawn.

Rejection of Claims under 35 U.S.C. §112

Claim 23 stands rejected under 35 U.S.C. §112, second paragraph, as being dependent on canceled claim 1 and because the phrase “said carrier” is indefinite. Claims 24 and 29 are rejected for their dependency on indefinite claim 23. Claim 23 is amended depend from claim 22 and is further amended to cancel “insulating carrier” from the claim so that claim 23 only recites one carrier, i.e., the thermally conductive carrier introduced in claim 22. In view of the above amendments and remarks, the rejection of claims 23, 24, and 29 under 35 U.S.C. §112, should now be withdrawn.

Rejection of Claims under 35 U.S.C. §§102 and 103

Claims 22-24, 26-31, and 33-36 stand rejected under 35 U.S.C. §102 as anticipated by U.S. Patent Application Publication No. 2002/0006040 (Kamada).

Claims 25, 32, and 37-44 stand rejected under 35 U.S.C. §103 as unpatentable over Kamada.

The present invention is directed to an illumination device including a light source 1 (see Fig. 1). The light source 1 includes an aluminum plate 7 on which a plastic frame 5 and luminous spots 6 are arranged (see Fig. 2; and page 7, lines 16-18 of the present application). The

frame 5 has holes in which the luminous spots 6 are located. As shown in Fig. 4, each of the luminous spots 6 includes light emitting diodes 9 arranged on a submount 10 which is connected directly to the aluminum plate 7. Furthermore, the submount 10 is not directly connected to the frame 5.

Independent claim 22 is amended to clarify that the carrier has a flat mounting surface and now recites “a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said carrier” and “said submounts exhibiting good thermal conductivity and connected to the flat mounting surface of said carrier such that the connections between said submounts and said carrier exhibit good thermal conductivity”.

As described in more detail below, Kamada fails to disclose, teach or suggest these limitations because Kamada fails to disclose teach or suggest (1) a thermally conductive carrier, and (2) that the luminous spots are arranged on a flat mounting surface of the carrier.

Kamada discloses an LED luminaire formed by a plurality of LED chips disposed on a MID (molded interconnect device) substrate (see abstract of Kamada). According to Figs. 1 and 2 of Kamada, a three dimensional circuit substrate 10 in the form of a MID is formed to have an array of dents 11 with a plurality of LED chips 1 mounted in the dents, i.e., on a bottom or side of the dents (see paragraph 0046 of Kamada). Kamada further discloses the method of manufacturing the substrate 10 in paragraphs 0047-0050 which involves injection molding a rectangular base from insulative material and then providing the dents 11 (see paragraph 0047). A metal film is applied and selectively removed to form circuit parts 12 (with the film) and non-circuit parts (without the film) (see paragraphs 0048-0050). The LED chips 1 are mounted directly in the dents 11 and are connected to the circuit parts 12 (paragraph 0051).

Fig. 6 of Kamada discloses a further embodiment in which a combination of LED chips 1a-1d are made as one unit referred to as a cell S (see paragraph 0061). This embodiment is made the same as the previous embodiment, wherein each dent 11 including four LED chips 1a-1d is regarded as one cell S (paragraph 0062). Kamada further discloses that each such cell S may be mounted to a printed substrate (paragraph 0062).

Since the LEDs of Kamada are arranged in the dents 11 of the substrate, Kamada fails to disclose “a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said carrier”, as expressly recited in independent claim 22. The Examiner alleges that the substrate 10 shown in Fig. 6 is the claimed thermally conductive carrier. This substrate of Kamada is made by injection molding and includes dents 11 (see paragraph 0061-0062 of Kamada). Accordingly, it does not have a flat mounting surface on which the plurality of luminous spots are arranged. Furthermore, Kamada specifically discloses that the substrate 10 is injection molded using various different insulative material which are listed, e.g., in paragraph 0047 of Kamada. However, none of the listed materials for making the substrate is thermally conductive. The Examiner states that submounts being thermally conductive is evidenced in paragraph 0123 of Kamada. While this section of Kamada does disclose a heat emitter 16A, there is no teaching or suggestion that the substrate 10 of Kamada is also thermally conductive. Thus, Kamada fails to teach or suggest “a thermally conductive carrier having a flat mounting surface and a plurality of luminous spots arranged in a grid format on the flat mounting surface of said carrier” and “said submounts exhibiting good thermal conductivity and connected to the flat mounting surface of said carrier such that the connections between said submounts and said carrier exhibit good thermal conductivity”.

In view of the above amendments and remarks, the rejection of independent claim 22 should now be withdrawn.

Dependent claims 23-44 are allowable for at least the same reasons as is independent claim 22, as well as for the additional reasons contained therein.

Regarding claims 26-27, which recite that the carrier is made of aluminum and copper, respectively, the Examiner refers to paragraphs 0048 and 0082. Paragraph 0048 merely states that a metal film is applied to the substrate 10 which eventually forms the circuit parts 12, as described above. Similarly, paragraph 0082 describes that an aluminum film is applied to the substrate 10 as a reflector. In each of the paragraphs referred to by the Examiner, the substrate 10 is made in accordance with MID procedures, i.e., injection molded, described in paragraph 0047. Since Kamada fails to disclose that the substrate itself is made of aluminum or copper, claims 26-27 should be allowable for at least these additional reasons.

Dependent claim 36 recites “wherein the ones of said luminous spots having said light emitting diodes associated with said electric circuit are interleaved with luminous spots associated with at least one other electric circuit”. The Examiner refers to paragraph 0146 of Kamada. However, this section of Kamada refers to Fig. 36 which shows that a plurality of LEDs are connected in series. There is no indication that these LEDs are interleaved in luminous spots having LEDs of other circuits. Furthermore, the schematic diagram show that each series connection is connected to the same control switch Q_1 . Thus, dependent claim 36 is allowable for these additional reasons.

Dependent claim 38 recites “control devices arranged and dimensioned for providing currents fed to each of the electric circuits, wherein said control devices, in the event of interruption of one of the electric circuits for said identically colored light emitting diodes

which causes a color shift in the color produced by said luminous spot, control the currents in the electric circuits for the at least one other electric circuit for the identically colored light emitting diodes or for differently colored light emitting diodes of the same luminous spots to compensate for the color shift produced by the interruption". The Examiner refers to paragraph 0146 and 0135. Paragraph 0135 refers to Fig. 31 which merely discloses a control. There is no indication that it compensates for color shift produced by interruption, as recited in claim 38. The circuit of Fig. 36 referred to in paragraph 0146 fails to disclose the claimed control. Rather, the current is always the same through each of the series of connected LEDs. Thus, there is no compensation for interruptions. Accordingly, dependent claim 38 is allowable for at least these additional reasons.

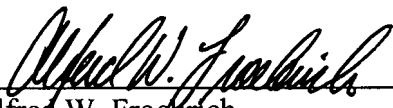
Claims 39-40 recite specific controls for compensating for interruptions. As described above, Kamada fails to disclose, teach or suggest such controls. Accordingly, claims 39-40 are also allowable for at least these additional reasons.

New independent claim 45 is also deemed to be allowable for the same reasons as is independent claim 22, as well as for the additional recitations contained therein.

In view of the above amendments and remarks, the application is now deemed to be in condition for allowance and notice to that effect is solicited.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,
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